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SEQUENCE LISTING

(1) GENERAL INFORMATION:

(i) APPLICANT: Choulika, Andre
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Dujon, Bernard
Nicolas, Jean-Francois

(ii) TITLE OF INVENTION: Nucleotide Sequence Encoding the Enzyme I-SCEI and the Uses Thereof

(iii) NUMBER OF SEQUENCES: 52

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(v) COMPUTER READABLE FORM:
(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: PatentIn Release #1.0, Version #1.25

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(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 714 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

ATGCATATGA AAAACATCAA	AAAAAACCAG	GTAATGAACC	TCGGTCCGAA	CTCTAAACTG	60	
CTGAAAGAAT	ACAAATCCCA	GCTGATCGAA	CTGAACATCG	AACAGTCGA	AGCAGGTATC	120
GGTCTGATCC	TGGGTGATGC	TTACATCCGT	TCTCGTGATG	AAGGTAAAAC	CTACTGTATG	180
CAGTTCGAGT	GGAAAAACAA	AGCATAACATG	GACCACGTAT	GTCTGCTGTA	CGATCAGTGG	240
GTACTGTCCC	CGCCGCACAA	AAAAGAACGT	GTTAACCAACC	TGGGTAACCT	GGTAATCACC	300
TGGGGCGCCC	AGACTTTCAA	ACACCAAGCT	TTCAACAAAC	TGGCTAACCT	GTTCATCGTT	360
AACAACAAAA	AAACCATCCC	GAACAACCTG	GTTGAAAAC	ACCTGACCCC	GATGTCTCTG	420
GCATACTGGT	TCATGGATGA	TGGTGGTAAA	TGGGATTACA	ACAAAAACTC	TACCAACAAA	480
TCGATCGTAC	TGAACACCCA	GTCTTCACT	TTCGAAGAAG	TAGAATACCT	GGTTAAGGGT	540
CTGCGTAACA	AATTCCAAC	GAACTGTTAC	GTAAAAATCA	ACAAAAACAA	ACCGATCATC	600
TACATCGATT	CTATGTCTTA	CCTGATCTTC	TACAACCTGA	TCAAACCGTA	CCTGATCCCG	660
CAGATGATGT	ACAAACTGCC	GAACACTATC	TCCTCCGAAA	CTTTCCTGAA	ATAA	714

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 237 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Met	His	Met	Lys	Asn	Ile	Lys	Lys	Asn	Gln	Val	Met	Asn	Leu	Gly	Pro
1					5					10					15
Asn	Ser	Lys	Leu	Leu	Lys	Glu	Tyr	Lys	Ser	Gln	Leu	Ile	Glu	Leu	Asn
					20				25						30

Ile Glu Gln Phe Glu Ala Gly Ile Gly Leu Ile Leu Gly Asp Ala Tyr
 35 40 45
 Ile Arg Ser Arg Asp Glu Gly Lys Thr Tyr Cys Met Gln Phe Glu Trp
 50 55 60
 Lys Asn Lys Ala Tyr Met Asp His Val Cys Leu Leu Tyr Asp Gln Trp
 65 70 75 80
Val Leu Ser Pro Pro His Lys Lys Glu Arg Val Asn His Leu Gly Asn
 85 90 95
 Leu Val Ile Thr Trp Gly Ala Gln Thr Phe Lys His Gln Ala Phe Asn
 100 105 110
 Lys Leu Ala Asn Leu Phe Ile Val Asn Asn Lys Lys Thr Ile Pro Asn
 115 120 125
 Asn Leu Val Glu Asn Tyr Leu Thr Pro Met Ser Leu Ala Tyr Trp Phe
 130 135 140
 Met Asp Asp Gly Gly Lys Trp Asp Tyr Asn Lys Asn Ser Thr Asn Lys
 145 150 155 160
 Ser Ile Val Leu Asn Thr Gln Ser Phe Thr Phe Glu Glu Val Glu Tyr
 165 170 175
 Leu Val Lys Gly Leu Arg Asn Lys Phe Gln Leu Asn Cys Tyr Val Lys
 180 185 190
 Ile Asn Lys Asn Lys Pro Ile Ile Tyr Ile Asp Ser Met Ser Tyr Leu
 195 200 205
 Ile Phe Tyr Asn Leu Ile Lys Pro Tyr Leu Ile Pro Gln Met Met Tyr
 210 215 220
 Lys Leu Pro Asn Thr Ile Ser Ser Glu Thr Phe Leu Lys
 225 230 235

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 722 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

AAAAATAAAA TCATATGAAA AATATTAAAA AAAATCAAGT AATCAATCTC GGTCTTATT	60
CTAAATTATT AAAAGAATAT AAATCACAAT TAATTGAATT AAATATTGAA CAATTTGAAG	120
CAGGTATTGG TTTAATTTA GGAGATGCTT ATATTCGTAG TCGTGATGAA GGTAAAACCTT	180

ATTGTATGCA ATTTGAGTGG AAAAATAAGG CATACATGGA TCATGTATGT TTATTATATG	240
ATCAATGGGT ATTATCACCT CCTCATAAAA AAGAAAGAGT TAATCATTAA GGTAAATTAG	300
TAATTACCTG GGGAGCTCAA ACTTTAAC ACAGCTTT TAATAAATTA GCTAACTTAT	360
TTATTGTAAA TAATAAAAAA CTTATTCTA ATAATTTAGT TGAAAATTAT TTAACACCTA	420
TGAGTCTGGC ATATTGGTTT ATGGATGATG GAGGTAAATG GGATTATAAT AAAAATTCTC	480
TTAATAAAAG TATTGTATTA AATACACAAA GTTTACTTT TGAAGAAGTA GAATATTTAC	540
TTAAAGGTTT AAGAAATAAA TTCAATTAA ATTGTATGT TAAAATTAAAT AAAAATAAAC	600
CAATTATTAA TATTGATTCT ATGAGTTATC TGATTTTTA TAATTTAATT AACCTTATT	660
TAATTCTCA AATGATGTAT AAACTGCCTA ATACTATTC ATCCGAAACT TTTTAAAAT	720
AA	722

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 235 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Met Lys Asn Ile Lys Lys Asn Gln Val Met Asn Leu Gly Pro Asn Ser	
1 5 10 15	
Lys Leu Leu Lys Glu Tyr Lys Ser Gln Leu Ile Glu Leu Asn Ile Glu	
20 25 30	
Gln Phe Glu Ala Gly Ile Gly Leu Ile Leu Gly Asp Ala Tyr Ile Arg	
35 40 45	
Ser Arg Asp Glu Gly Lys Thr Tyr Cys Met Gln Phe Glu Trp Lys Asn	
50 55 60	
Lys Ala Tyr Met Asp His Val Cys Leu Leu Tyr Asp Gln Trp Val Leu	
65 70 75 80	
Ser Pro Pro His Lys Lys Glu Arg Val Asn His Leu Gly Asn Leu Val	
85 90 95	
Ile Thr Trp Gly Ala Gln Thr Phe Lys His Gln Ala Phe Asn Lys Leu	
100 105 110	
Ala Asn Leu Phe Ile Val Asn Asn Lys Lys Leu Ile Pro Asn Asn Leu	
115 120 125	
Val Glu Asn Tyr Leu Thr Pro Met Ser Leu Ala Tyr Trp Phe Met Asp	

130	135	140
Asp Gly Gly Lys Trp Asp Tyr Asn Lys Asn Ser Leu Asn Lys Ser Ile		
145	150	155
Val Leu Asn Thr Gln Ser Phe Thr Phe Glu Glu Val Cys Tyr Leu Val		
165	170	175
Lys Gly Leu Arg Asn Lys Phe Gln Leu Asn Cys Tyr Val Lys Ile Asn		
180	185	190
Lys Asn Lys Pro Ile Ile Tyr Ile Asp Ser Met Ser Tyr Leu Ile Phe		
195	200	205
Tyr Asn Ile Ile Lys Pro Tyr Leu Ile Pro Gln Met Met Tyr Lys Leu		
210	215	220
Pro Asn Thr Ile Ser Ser Glu Thr Phe Leu Lys		
225	230	235

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 754 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

CCGGATCCAT GCATATGAAA AACATCAAAA AAAACCAGGT AATGAACCTG GGTCCGAACT	60
CTAAACTGCT GAAAGAATAC AAATCCCAGC TGATCGAACT GAACATCGAA CAGTCGAAG	120
CAGGTATCGG TCTGATCCTG GGTGATGCTT ACATCCGTT TCCTGATGAA GGTAAAACCT	180
ACTGTATGCA GTTCGAGTGG AAAAACAAAG CATACTGGG CCACGTATGT CTGCTGTACG	240
ATCAGTGGGT ACTGTCCCCG CCGCACAAAA AACAAACGTGT TAACCACCTG GGTAACCTGG	300
TAATCACCTG GGGCGCCAG ACTTTCAAAC ACCAAGCTTT CAACAAACTG GCTAACCTGT	360
TCATCGTTAA CAACAAAAAA ACCATCCCGA ACAACCTGGT TGAAAACCTAC CTGACCCCGA	420
TGTCTCTGGC ATACTGGTTC ATGGATGATG GTGGTAAATG GGATTACAAC AAAAATCTA	480
CCAACAAATC GATCGTACTG AACACCCAGT CTTTCACTTT CGAAGAAGTA GAATACCTGG	540
TTAAGGGTCT GCGTAACAAA TTCCAATGAA ACTGTTACGT AAAAATCAAC AAAAACAAAC	600
CGATCATCTA CATCGATTCT ATGTCTTACC TGATCTTCTA CAACCTGATC AAACCGTACC	660
TGATCCCGCA GATGATGTAC AAACTGCCGA ACACATCTC CTCCGAAACT TTCCCTGAAAT	720

AATAAGTCGA CTGCAGGATC CGGTAAGTAA GTAA

754

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 11 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

AATGCTTCC A

11

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 25 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

GTTACGCTAG GGATAAACAGG GTAAT

25

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 25 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

CAATGCGATC CCTATTGTCC CATTA

25

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1738 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

GC GGACAGGT ATCCGGTAAG CGGCAGGGTC GGAACAGGAG AGCGCACGAG GGAGCTTCCA	60
GGGGGAAACG CCTGGTATCT TTATAGTCCT GTGGGTTTC GCCACCTCTG ACTTGAGCGT	120
CGATTTTGT GATGCTCGTC AGGGGGCGG AGCCTATGGA AAAACGCCAG CAACGCGGCC	180
TTTTACGGT TCCTGGCCTT TTGCTGGCCT TTTGCTCACA TGTTCTTCC TGCCTTATCC	240
CCTGATTCTG TGGATAACCG TATTACCGCC TTTGAGTGAG CTGATACCGC TCGCCGCAGC	300
CGAACGACCG AGCGCAGCGA GTCAGTGAGC GAGGAAGCGG AAGAGCGCCC AATACGAAA	360
CCGCCTCTCC CCGCGCGTTG GCCGATTCA TAATGCAGCT GGCACGACAG GTTCCCGAC	420
TGGAAAGCGG GCAGTGAGCG CAACGCAATT AATGTGAGTT AGCTCACTCA TTAGGCACCC	480
CAGGCTTTAC ACTTTATGCT TCCGGCTCGT ATGTTGTGTG GAATTGTGAG CGGATAACAA	540
TTTCACACAG GAAACAGCTA TGACCATGAT TACGAATTCT CATGTTGAC AGCTTATCAT	600
CGATAAGCTT TAATGCGTA GTTTATCACA GTTAAATTGC TAACGCAGTC AGGCACCGTG	660
TATGAAATCT AACAAATGCGC TCATCGTCAT CCTCGGCACC GTCACCCCTGG ATGCTGTAGG	720
CATAGGCTTG GTTATGCCGG TACTGCCGG CCTCTTGC GG GATATCCGCC TGATGCGTGA	780
ACGTGACGGA CGTAACCACC GCGACATGTG TGTGCTGTTC CGCTGGCAT GCCAGGACAA	840
CTTCTGGTCC GGTAACGTGC TGAGCCGGC CAAGCTTACT CCCCCATCCCC CTGTTGACAA	900
TTAACATCG GCTCGTATAA TGTGTGGAAT TGTGAGCGGA TAACAATTTC ACACAGGAAA	960
CAGGATCCAT GCATATGAAA AACATCAAAA AAAACCAGGT AATGAACCTG GGTCCGAAC	1020
CTAAACTGCT GAAAGAATAC AAATCCCAGC TGATCGAACT GAACATCGAA CAGTTCGAAG	1080
CAGGTATCGG TCTGATCCTG GGTGATGCTT ACATCCGTTC TCGTGATGAA GGTAAAACCT	1140
ACTGTATGCA GTTCGAGTGG AAAAACAAAG CATACTGGG CCACGTATGT CTGCTGTACG	1200
ATCAGTGGGT ACTGTCCCCG CCGCACAAAA AAGAACGTGT TAACCACCTG GGTAACCTGG	1260
TAATCACCTG GGGCGCCAG ACTTTCAAAC ACCAAGCTTT CAACAAACTG GCTAACCTGT	1320
TCATCGTTAA CAACAAAAAA ACCATCCCGA ACAACCTGGT TGAAAACCTAC CTGACCCCGA	1380
TGTCTCTGGC ATACTGGTTC ATGGATGATG GTGGTAAATG GGATTACAAC AAAAACTCTA	1440
CCAACAAATC GATCGTACTG AACACCCAGT CTTTCACTTT CGAAGAAGTA GAATACCTGG	1500
TTAAGGGTCT GCGTAACAAA TTCCAATGAA ACTGTTACGT AAAAATCAAC AAAAACAAAC	1560

CGATCATCTA CATCGATTCT ATGTCTTACC TGATCTTCTA CAACCTGATC AAACCGTACC	1620
TCATCCCCCA GATGATGTAC AAACTGCCGA ACACTATCTC CTCCGAAACT TTCCCTGAAAT	1680
AATAAGTCGA CCTGCAGCCC AAGCTTGGCA CTGGCCGTG TTTTACAACG TCGTGACT	1738

(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 37 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

Met Leu Val Arg Gly Ala Glu Pro Met Glu Lys Arg Gln Gln Arg Gly
1 5 10 15

Leu Phe Thr Val Pro Gly Leu Leu Leu Ala Phe Cys Ser His Val Leu
20 25 30

Ser Cys Val Ile Pro
35

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 14 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

Met Gln Leu Ala Arg Gln Val Ser Arg Leu Glu Ser Gly Gln
1 5 10

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 13 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

Met Leu Pro Ala Arg Met Leu Cys Gly Ile Val Ser Gly

(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

Met Thr Met Ile Thr Asn Ser His Val
1 5

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 80 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

Met Lys Ser Asn Asn Ala Leu Ile Val Ile Leu Gly Thr Val Thr Leu
1 5 10 15

Asp Ala Val Gly Ile Gly Leu Val Met Pro Val Leu Pro Gly Leu Leu
20 25 30

Arg Asp Ile Arg Leu Met Arg Glu Arg Asp Gly Arg Asn His Arg Asp
35 40 45

Met Cys Val Leu Phe Arg Trp Ala Cys Gln Asp Asn Phe Trp Ser Gly
50 55 60

Asn Val Leu Ser Pro Ala Lys Leu Thr Pro His Pro Pro Val Asp Asn
65 70 75 80

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 7 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

Met Cys Gly Ile Val Ser Gly
1 5

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 237 amino acids
- (B) TYPE: amino acid
- (C) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

Met His Met Lys Asn Ile Lys Lys Asn Gln Val Met Asn Leu Gly Pro
1 5 10 15

Asn Ser Lys Leu Leu Lys Glu Tyr Lys Ser Gln Leu Ile Glu Leu Asn
20 25 30

Ile Glu Gln Phe Glu Ala Gly Ile Gly Leu Ile Leu Gly Asp Ala Tyr
35 40 45

Ile Arg Ser Arg Asp Glu Gly Lys Thr Tyr Cys Met Gln Phe Glu Trp
50 55 60

Lys Asn Lys Ala Tyr Met Asp His Val Cys Leu Leu Tyr Asp Gln Trp
65 70 75 80

Val Leu Ser Pro Pro His Lys Lys Glu Arg Val Asn His Leu Gly Asn
85 90 95

Leu Val Ile Thr Trp Gly Ala Gln Thr Phe Lys His Gln Ala Phe Asn
100 105 110

Lys Leu Ala Asn Leu Phe Ile Val Asn Asn Lys Lys Thr Ile Pro Asn
115 120 125

Asn Leu Val Glu Asn Tyr Leu Thr Pro Met Ser Leu Ala Tyr Trp Phe
130 135 140

Met Asp Asp Gly Gly Lys Trp Asp Tyr Asn Lys Asn Ser Thr Asn Lys
145 150 155 160

Ser Ile Val Leu Asn Thr Gln Ser Phe Thr Phe Glu Glu Val Glu Tyr
165 170 175

Leu Val Lys Gly Leu Arg Asn Lys Phe Gln Leu Asn Cys Tyr Val Lys
180 185 190

Ile Asn Lys Asn Lys Pro Ile Ile Tyr Ile Asp Ser Met Ser Tyr Leu
195 200 205

Ile Phe Tyr Asn Leu Ile Lys Pro Tyr Leu Ile Pro Gln Met Met Tyr

210

215

220

Lys Leu Pro Asn Thr Ile Ser Ser Glu Thr Phe Leu Lys
225 230 235

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 26 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

CGCTAGGGAT AACAGGGTAA TATAGC

26

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 26 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

GCGATCCCTA TTGTCCCCATT ATATCG

26

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 26 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

TTCTCATGAT TAGCTCTAAT CCATGG

26

(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 26 base pairs
(B) TYPE: nucleic acid

- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

AAGAGTACTA ATCGAGATTA GGTACC

26

(2) INFORMATION FOR SEQ ID NO:21:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

CTTTGGTCAT CCAGAAGTAT ATATTT

26

(2) INFORMATION FOR SEQ ID NO:22:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

GAAACCAGTA GGTCTTCATA TATAAA

26

(2) INFORMATION FOR SEQ ID NO:23:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

TAACGGTCCT AAGGTAGCGA AATTCA

26

(2) INFORMATION FOR SEQ ID NO:24:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

ATTGCCAGGA TTCCATCGCT TTAAGT

26

(2) INFORMATION FOR SEQ ID NO:25:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

TGACTCTCTT AAGGTAGCCA AATGCC

26

(2) INFORMATION FOR SEQ ID NO:26:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

ACTGAGAGAA TTCCATCGGT TTACGG

26

(2) INFORMATION FOR SEQ ID NO:27:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

CGAGGTTTG GTAACTATTT ATTACC

26

(2) INFORMATION FOR SEQ ID NO:28:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

CCTCCAAAAC CATTGATAAA TAATGG

26

(2) INFORMATION FOR SEQ ID NO:29:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

GGGTTCAAAA CGTCGTGAGA CAGTTT

26

(2) INFORMATION FOR SEQ ID NO:30:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

CCCAAGTTTT GCAGCACTCT GTCAAA

26

(2) INFORMATION FOR SEQ ID NO:31:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid

- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

GATGCTGTAG GCATAGGCTT GGTTAT

26

(2) INFORMATION FOR SEQ ID NO:32:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

CTACGACATC CGTATCCGAA CCAATA

26

(2) INFORMATION FOR SEQ ID NO:33:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

CTTTCCGCAA CAGTATAATT TTATAA

26

(2) INFORMATION FOR SEQ ID NO:34:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

GAAAGGCGTT GTCATATTAA AATATT

26

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

ACCATGGGGT CAAATGTCTT TCTGGG

26

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

TGGTACCCCA GTTTACAGAA AGACCC

26

(2) INFORMATION FOR SEQ ID NO:37:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

GTGCCTGAAT GATATTATT ACCTTT

26

(2) INFORMATION FOR SEQ ID NO:38:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

GTGCCTGAAT GATATTTATT ACCTTT

26

(2) INFORMATION FOR SEQ ID NO:39:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 39 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

CAACGCTCAG TAGATGTTTT CTTGGGTCTA CCGTTTAAT

39

(2) INFORMATION FOR SEQ ID NO:40:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 39 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

GTTGCGAGTC ATCTACAAAA GAACCCAGAT GGCAAATTA

39

(2) INFORMATION FOR SEQ ID NO:41:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 32 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

CAAGCTTATG AGTATGAAGT GAACACGTTA TT

32

(2) INFORMATION FOR SEQ ID NO:42:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 32 base pairs
- (B) TYPE: nucleic acid

- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

GTTCGAATAC TCATACTTCA CTTGTGCAAT AA

32

(2) INFORMATION FOR SEQ ID NO:43:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 38 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

GCTATTCGTT TTTATGTATC TTTTGCCTGT AGCTTTAA

38

(2) INFORMATION FOR SEQ ID NO:44:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 38 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

CGATAAGCAA AAATACATAG AAAACGCACA TGGAAATT

38

(2) INFORMATION FOR SEQ ID NO:45:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 80 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

CCAAGCTCGA ATTCCGCATGC TCTAGAGCTC GGTACCCGGG ATCCTGCAGT CGACGCTAGG

60

GATAACAGGG TAATACAGAT

80

(2) INFORMATION FOR SEQ ID NO:46:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 80 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

GGTTCGAGCT TAAGCGTACG AGATCTCGAG CCATGGGCC TAGGACGTCA GCTGCGATCC

60

CTATTGTCCC ATTATGTCTA

80

(2) INFORMATION FOR SEQ ID NO:47:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 80 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

ATCAGATCTA AGCTTGCATG CCTGCAGGTC GACTCTAGAG GATCCCCGGG TACCGAGCTC

60

GAATTCACTG GCCGTCGTTT

80

(2) INFORMATION FOR SEQ ID NO:48:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 80 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

TAGTCTAGAT TCGAACGTAC GGACGTCCAG CTGAGATCTC CTAGGGGCC ATGGCTCGAG

60

CTTAAGTGAC CGGCAGCAAA

80

(2) INFORMATION FOR SEQ ID NO:49:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 80 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

TACAACGTCG TGACTGGAA AACCTGGCG TTACCCAAT TAATGCCCT GCAGCACATC	60
CCCCTTTCGC CAGCTGGCGT	80

(2) INFORMATION FOR SEQ ID NO:50:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 80 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

ATGTTGCAGC ACTGACCCCTT TTGGGACCGC AATGGGTTGA ATTAGCGGAA CGTCGTGTAG	60
GGGGAAAGCG GTCGACCGCA	80

(2) INFORMATION FOR SEQ ID NO:51:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

TAGGGATAAC AGGGTAAT	18
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(2) INFORMATION FOR SEQ ID NO:52:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

ATCCCTATTG TCCCCATTA

18